EXAMINER'S REMARKS

Claims 1-5 were rejected under 35 U.S.C. § 102(b) as being anticipated by USPN 5,946,127 to Nagata (hereinafter, "Nagata").

Claims 1 and 11-12 were rejected under 35 U.S.C. § 102(e) as being anticipated by USPN 6,170,795 to Wayne (hereinafter, "Wayne").

Claims 13-14 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Nagata.

Claims 15-18 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Wayne in view of Nagata.

Claims 6-10 were objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

REMARKS

Claims 1-15 and 17-18 remain in this application. Claims 1, 15, and 17 have been amended. Claim 16 has been deleted.

A. Patentability of independent claim 1

1. Patentability over Nagata

Claims 1-5 were rejected under 35 U.S.C. § 102(b) as being anticipated by Nagata. Nagata teaches an image pick-up apparatus such as a robotic eye, wherein a sphere 15 containing an image sensor is used to track a moving object. Sphere 15 is surrounded by a plurality of ball bearings 26 (column 3, lines 22-26; Figure 1). The ball bearings 26 are used to facilitate easy movement of the sphere 15 by providing a rolling friction to make the sphere 15 easier to rotate (column 3, lines 26-30). Thus, the sphere can be rotated with just a very small force (column 3, lines 30-31).

In distinct contrast to the prior art, the present invention uses two sets of curved surfaces to securely hold a sphere in place. (Page 3, paragraph 6; Figure 2B). After alignment, the sphere must remain stationary despite mechanical shock and vibration. This is not possible with the Nagata apparatus, as the sphere is designed to move with just a very small force. Independent claim 1 has been amended to clearly recite this novel feature: "... the first and second set of curved surfaces so constructed and arranged such that the sphere has freedom for prescribed movement when required, but is otherwise securely held stationary." (Underlining added).

2. Patentability over Wayne

Claims 1 and 11-12 were rejected under 35 U.S.C. § 102(e) as being anticipated by Wayne. Wayne teaches a sphere that is held in place using one set of balls 20 on one side of the sphere 12, and a single plunger 26 on the opposite side of the sphere (Figure 9).

In distinct contrast to the prior art, the present invention teaches two sets of curved surfaces, one set on each side of the sphere (Page 5, paragraph 18; Figure 2B). Independent claim 1 has been amended to clearly recite this feature: "... a first set of curved surfaces in contact with the sphere; and a second set of curved surfaces in contact with the sphere, opposed to the first set of curved surfaces..." (underlining added).

3. Claims 1-14 are allowable

For the reasons cited above, independent claim 1 is believed to be allowable. Dependent claims 2-14 are also believed to be allowable, based on the allowability of claim 1. No new matter has been introduced with this amendment. The rejections to claims 1-14 are believed to be overcome.

B. Patentability of dependent claim 4

Claim 4 recites that each ball in the first set of balls is opposite and collinear to a corresponding ball in the second set of balls. Each ball applies a force to the sphere that is equal and diametrically opposed to its corresponding ball (Page 6, paragraph 20). This symmetry is an important feature because it improves the stability of the optomechanical system and makes it resistant to movement due to mechanical shocks and temperature variations (Page 2, paragraph 5). This feature is absent from Nagata because the ball bearings are not used to provide stability to the sphere, but rather to facilitate its rotation. The ball bearings are not diametrically opposed to each other (Figure 1) because it is not necessary for the rotation of the sphere. Applicant respectfully submits that claim 4 is allowable.

C. Patentability of claims 15-18

Claims 15-18 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Wayne in view of Nagata.

Applicant respectfully asserts that Wayne combined with Nagata does not suggest the present invention. Wayne teaches an optomechanical system with a sphere. Nagata teaches a first magnet in contact with the sphere, and a second magnet that controls the movement of the sphere, using the magnetic attraction between the first and second magnet. Wayne in combination with Nagata would result in an optomechanical system with a sphere, wherein the sphere has a first magnet attached to it, and the movement of the sphere is controlled by a second magnet, using the magnetic attraction between the first and second magnet. Both the first and second magnets must be movable.

In distinct contrast to the prior art, the magnets in the present invention are fixed in place on the housing (Page 9, lines 2-6 of paragraph 31). The magnets, in turn, hold the sphere in place using the magnetic attraction between the magnets and the sphere (Page 9, lines 1-2 of paragraph 31). The magnets are not moved at all. This patentable distinction can be found in claim 15, as amended: "... a plurality of magnets fixed to the housing and in contact with the sphere..."(underlining added).

Independent claim 15 is believed to be allowable. Claim 16 was deleted, and its limitations incorporated into claim 15. Dependent claim 17 was amended to depend off of claim 15. Dependent claims 17-18 are believed to be allowable, based on the allowability of claim 15. No new matter has been introduced with this amendment. The rejections to claims 15 and 17-18 are believed to be overcome.

CONCLUSION

If there are any further questions or more discussion required, the Examiner is invited to call the Applicant's agent at the telephone number given below.
In view of the above, the application is now believed to be in condition for allowance. It is courteously requested that such allowance be granted at an early date.

Respectfully submitted,
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